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Vesicular Stomatitis Update

Two isolations of vesicular stomatitis virus, New Jersey type (VSNJ), were made in July 1983, from fluid collected from vesicles on the snouts of pigs on Ossabaw Island, Ga.

Numerous investigations of vesicular conditions, especially in the Rocky Mountain States, have failed to detect additional cases. Investigations involving horses in Colorado and Wyoming have detected high complement-fixation and virus neutralization titers; however attempts to isolate VS virus have not been successful. The last case related to the major outbreak reported in previous issues of the Foreign Animal Disease Report was a cow in a Nebraska herd sampled on May 25, 1983. (Dr. K. A. Hand, 301 436-8085).

Vesicular Stomatitis on Ossabaw Island

On July 6, 1983, Southeastern Cooperative Wildlife Disease Study (SCWDS) technicians, who were working on Ossabaw Island, Ga., trapped a feral hog which had a 1.27-cm vesicle on the dorsal rim of its snout. Testing at the Plum Island Animal Disease Center resulted in an isolation of New Jersey-type vesicular stomatitis virus. Subsequent investigation revealed only one additional case, which was observed on July 23. In both animals, lesions were extremely transient.

This is the first time vesicular stomatitis virus has been recovered from the isolated island. However, on many occasions since 1965, vesicular stomatitis has been diagnosed there in hogs, cattle, horses, burros, raccoons, and white-tailed deer, based on serological evidence.

During the past 3 years, the SCWDS has been conducting serological surveillance on Ossabaw Island. Juvenile feral hogs were used as sentinels during 1982 and 1983 in a capture-work-release system to study the temporal appearance of sero-positive animals during the spring to fall period. For these years, seroconversions first appeared during late May and June. Subclinical infections appear to be the rule since over

900 work-days and over 3,000 observations of wild swine were used in discovering these two active cases.

Dr. Victor F. Nettles, a foreign animal disease diagnostician and SCWDS veterinarian, has examined other species on Ossabaw Island following discovery of the vesicle. All cattle, horses, burros, and deer examined during the survey appeared generally healthy. Continual observations and sampling are planned.

Serological evidence of vesicular stomatitis has also been found in Ga., Fla., La., and Ark. (Dr. V. F. Nettles Jr., SCWDS, 404 548-1032)

VS Vaccine

Two vaccines have been conditionally licensed to control vesicular stomatitis. These are among the first veterinary biological products to be marketed under a new authorization for limited or emergency use. USDA granted the licenses to Colorado Serum Co., Denver, Colo., and Syntex Laboratories, Des Moines, Iowa. License conditions will assure protection for users and set a 1-year limit on the license validity. Each license is based on promising research and development. Each producer has submitted an approved outline of production, and has developed studies, now in progress, to demonstrate product effectiveness within the licensing period. These vaccines may be used only in States where animal health officials have requested them.

Under the Virus-Serum-Toxin Act of 1913, all veterinary biologics, such as vaccines, bacterins, antigens, and toxins, must be licensed by USDA if they are distributed in interstate trade. Biologics manufacturers must also obtain establishment licenses that require high standards of operations, sanitation, quality control, and recordkeeping. (APHIS News Center, 301 436-7799)

VVND Update

Two cases of exotic Newcastle disease (VVND) were diagnosed in southern Texas during the first week of July 1983. These were in game chickens in backyard-type operations, as were the six other cases in Texas this year.

Exotic Newcastle disease in young yellow-naped Amazon parrots was diagnosed in California (11), Nevada (2), Kentucky (1), New York (1), and Florida (1). Numerous reports indicate that the smuggling of Mexican yellowheads and redheads has increased. Specimens collected during disease investigations conducted Oct. 1, 1982-Sept. 20, 1983, related to these species, have been free of exotic Newcastle disease virus. (Dr. K. A. Hand, 301 436-8085)

Haiti ASF Program

Haiti continues to be free of any indication of African swine fever (ASF). Native pigs that were being held in quarantine pens on Ile de la Tortue were depopulated August 12, 1983. The meat from these pigs was thoroughly cooked and given to the islanders.

A small community of feral swine has been discovered on an isolated plateau northwest of the city of Gonaives. Wildlife biologists from the University of Georgia are aiding in the sampling and eradication of these feral swine.

A total of 1,725 sentinel swine have been imported into Haiti. Of these, 1,175 were placed at 300 field sites. Two hundred seventy-five of the swine in import quarantine facilities were placed at sentinel sites during the week of Oct. 3. The 275 remaining in import quarantine facilities were placed at sentinel sites during the week of Oct. 10. Areas of Haiti being sentinelized during September are the northern half of the country and the western tip of the southern peninsula.

ASF has not been found in Haiti since May 1982. (Dr. James A. Downard, 301 436-5256)

Bluetongue Update

Isolation of bluetongue virus serotype 2 from sentinel cattle at Ona, Fla., reported in the Sept. 1983 issue (11-3) of Foreign Animal Disease Report, increases the total bluetongue serotypes found in the United States to five. These are serotypes 2, 10, 11, 13, and 17.

Serotype 2 virus was isolated from 15 of 38 samples collected from the herd in Sept. and Oct. 1982. Fifty-seven samples collected from the same herd in August, November, and December of that year yielded no virus.

Vectors trapped during the period of seroconversion of the cattle included numerous <u>Culicoides insignis</u>. Bluetongue virus serotype 2 isolated from these <u>C. insignis</u> was the first reported isolation of bluetongue virus in the United States from vectors other than <u>C. variipennis</u>. (Dr. J. R. Pitcher, 301 436-8231)

Exotic Diptera

Because of their abundance, widespread distribution, and strong flight, the many species of exotic flies (Diptera) found throughout the world represent a potential for introduction and establishment in the United States. This report summarizes a survey conducted in June and July 1983, as a followup to the introduction in 1982 of the exotic fly, <u>Musca vitripennis</u> (see the March 1983 issue of Foreign Animal Disease Report). It also reviews actions taken following the capture of an exotic louse fly (<u>Hippobosca longipennis</u>) in North Carolina.

No <u>M. vitripennis</u> were trapped at several locations on McGuire AFB or at 10 adjacent farms. Since the farms surveyed represent a variety of habitats acceptable to both immature and adult muscoid flies, it appears that <u>M. vitripennis</u>, if present in 1982, did not overwinter and establish in the area. The capture of numerous ecologically similar domestic flies at many sites indicate that the likelihood of <u>M. vitripennis</u> being present but overlooked is low.

A single louse fly, <u>H. longipennis</u>, was captured on a bat-eared fox (<u>Otocyon megalotus</u>) imported from South Africa, at the North Carolina Zoological Park, Asheboro, N.C., May 16, 1983. <u>H. longipennis</u>, an Old World ectoparasite of the families Canidae, Felidae, Hyaenidae, and Viverridae, also was introduced into the United States on African cheetahs in 1972. Infestations

at several wildlife parks were eradicated by control programs involving repeated treatments of infested animals and premises.

A site visit to the North Carolina Zoological Park on May 24-25, 1983, by E. T. Schmidtmann, Agricultural Research Service (ARS), and B. S. Perryman, APHIS-VS, confirmed that the louse fly had been captured from one of several bat-eared foxes caged in an underground room that also served as the night holding facility for seven lions. The fly was found when the foxes were being restrained for worming and flea control treatment. The fox pens were located 9 meters (30 feet) from the lion cages. Bedding from the pens was taken daily to the zoo landfill, but not buried.

No louse flies were found on the bat-eared foxes, and a search of the lion cages and fox pens did not turn up any louse fly puparia during the May visit. It was recommended that all bedding from the foxes and lions be buried immediately, the foxes and lions be observed twice daily for evidence of louse fly infestation, the lion outdoor-viewing arena be searched for louse fly puparia, and the lions be treated to kill any louse flies that may have gone unobserved.

A second site visit June 2-3, 1983, disclosed no louse fly puparia in the lion arena. The lions were treated with 5% carbaryl dust, applied by backpack power duster. No evidence of louse fly infestation had been observed during the previous 8 days, and there was no evidence that the foxes were currently infested, or that the lions had ever been infested. The accumulation of zoo animal bedding and manure at the landfill had been buried. As a further precaution, the lions were again treated with 5% carbaryl dust. Thus, there was no evidence that either the foxes, lions, or their quarters were infested. Since the pupation period for _H. longipennis_ at 20°C is reported to exceed the interval that the bat-eared foxes had been at the zoo, there is little chance that any puparia could have produced louse flies prior to destruction by burial. (Dr. E. T. Schmidtmann, 301 344-2478)

World Animal Disease Roundup

Since the last Foreign Animal Disease report (11-3), **rinderpest** in Africa is still the disease of most concern. Efforts to solicit funds for a regional vaccination campaign, similar to the one conducted over a decade ago, ran into great difficulties. The disease has caused tremendous losses in Nigeria. Some unconfirmed sources speak of half the total cattle population having been wiped out. In Tanzania, where the disease was earlier reported to be raging among wildlife, the cattle population is now becoming affected. Vaccine appears to be in short supply. For more details, see the article on rinderpest by Dr. A. H. Dardiri elsewhere in this issue.

Foot-and-mouth disease was reported in most areas where it is considered to be endemic. Of special interest is the fact that type SAT_2 was reported in Senegal. SAT types are usually reported only from the southern part of the African continent. Central and Northern Europe did not report any problems.

Glanders, usually seen only in Turkey, South Africa, and Namibia, was reported in Mauritania.

Swine vesicular disease (SVD) has been fairly quiet. Only one case was reported in France. Serological evidence of SVD without clinical signs was found in a shipment of Swedish pigs after arrival in Hungary. Extensive investigation in Sweden did not pinpoint a source. Swedish officials believe that a different virus may be involved and still consider the country free of SVD. Testing now in progress at Pirbright, England, may settle the issue. (Dr. H. J. Seyffert, 301 436-8285)

Special Report...

Puerto Rico Tick Program

The island Commonwealth of Puerto Rico, in the Greater Antilles Caribbean island chain, was the site of the 1936-54 USDA/Puerto Rico Department of Agriculture Cooperative Boophilus microplus (tropical cattle tick) Tick Eradication Program. This arthropod and the disease, bovine babesiosis (piroplasmosis), it transmits were eradicated. This early success involved eliminating ticks from an estimated 600,000 head of livestock at a total estimated cost of $7.4 million.

Then, in June of 1974, the tropical bont tick Amblyomma variegatum was found in over 30 premises in Cidra municipality. Its origin was never determined.

Lacking funds for eradication, a limited tick control program was implemented. By 1978, 105 premises in 8 municipalities were found infested.

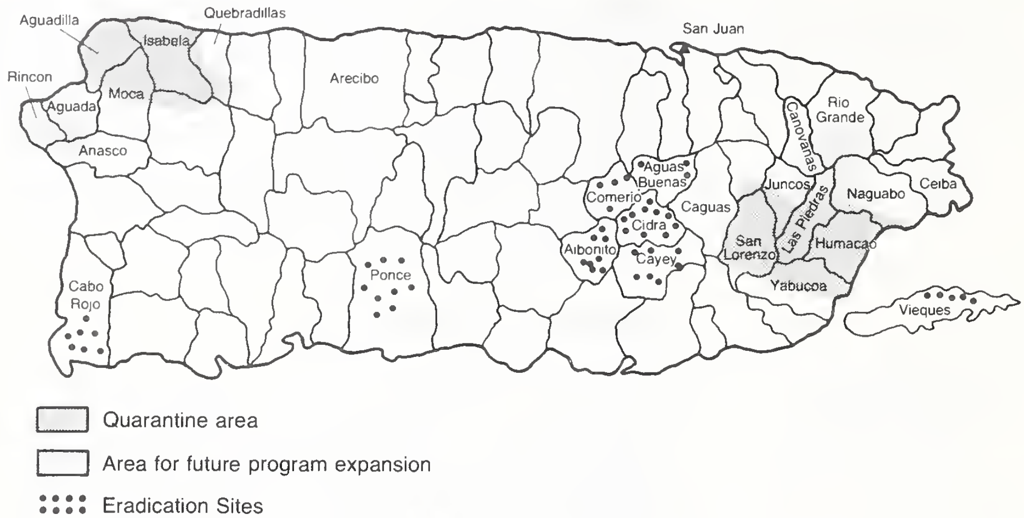
Infestation with A. variegatum has been closely associated with dermatophilosis, a severe and often fatal skin disease of cattle and sheep. Heartwater and other diseases that may be transmitted by A. variegatum have not been found in Puerto Rico.

Tropical cattle ticks were discovered for the second time in late 1977, but bovine babesiosis was not diagnosed in the infested cattle. This observation has fostered the idea that B. microplus arrived with nonbovine species of livestock. Over 550 premises were found infested by December 1978. Teams were trained for surveys and pesticide application, needed equipment bought, and necessary laws and regulations written and implemented. Available resources were diverted from the control of bont ticks to plan and initiate the eradication effort against tropical cattle ticks. Actual pesticide spraying operations started in July 1979.

An estimated 90% of the herds outside the eradication zones are now considered to be tick infested.

The presence of the tropical horse tick, Dermacentor nitens, was the justification for Federal quarantine from 1952 to 1974, when A. variegatum was found. Tropical horse ticks are the vectors of Babesia caballi, an agent of equine piroplasmosis, a disease present in Puerto Rico.

Puerto Rico



Status and program progress--There are two quarantine and eradication areas, one based in Arecibo at the northwestern end of the island, and the other in Juncos, near the capital of San Juan. Eradication efforts against tropical cattle ticks are limited to the gradual and complete coverage of all infested herds in these two quarantine areas by a pesticide spray program. Pesticides used have included coumaphos and crotoxyphos in the past, and permethrin and amitraz at present. Eight months of systematic treatment of all livestock every 2 weeks has been effective in eliminating tropical cattle ticks. Livestock on unaffected premises are inspected every 2 months.

Field studies have shown that by treating cattle, horses, sheep, and goats, and vigorously reducing the number of dogs in infested areas, the tropical bont tick can be eliminated. The tick lifecycle can be broken by attacking only the adult stage every 2 weeks. Consequently, in April 1981, treatment of bont tick-infested premises began at Cidra. As infested premises were cleared, other herds in new locations were added to the program. The last known foci of bont ticks on the island of Vieques were placed under treatment in June 1982.

The number of infestations by bont ticks has decreased dramatically. None have been found in the Cidra area since February 1982. When 18 months of treatment are completed, herds are studied to determine the advisability of suspending treatment. Selected herds are released from quarantine. All known cases of dermatophilosis have been eliminated as a result of pesticide spraying and treatment with long-acting penicillin.

Tropical cattle tick eradication operations have been consolidated in the Arecibo area and the level of activity reduced to treatment of occasional reinfestations. Program expansion in this area will be moderate and is currently underway. Treatments and surveillance at the Juncos station

are approaching complete coverage and, as additional resources become available, major expansions will occur. Herds free of tropical cattle ticks at both stations now total 3,110. Of the estimated 5,375 herds included in both areas, 1,558 (29%) are currently under treatment. This percentage is gradually decreasing as coverage improves and additional herds are released.

The future of the Puerto Rico Tick Eradication Program depends on continued funding. (Dr. Bob H. Bokma, San Juan, Puerto Rico, 809 724-0466)

Potential Impacts of ASF in Canada

The potential economic impacts of an outbreak of African swine swine fever (ASF) have recently been estimated for Canada. The study, published as an Agriculture Canada Economic Working Paper (Kirk, Bruce D., 1981, Potential Impacts of African swine Fever, Economic Working Paper, Agriculture Canada), examined three different scenarios corresponding to the assumed severity of the outbreak, its geographic incidence, and the length of time that would be required to control and eradicate the disease. Three types of costs were estimated for each scenario: program costs including the direct costs of controlling and eradicating the disease, indemnity payments to hog producers for animals slaughtered, and welfare losses arising from changes in retail prices and quantities due both to herd depopulation and the attendant embargo on Canadian exports of hogs, pork, and pork products.

Scenario I examined an ASF outbreak near Montreal, which was quickly eliminated; however the export embargo was assumed to last for a full year. Scenario II entailed a more serious outbreak across eastern and central Canada. It was assumed that 2 years would be required to eradicate the disease with the export embargo lasting 3 years. In Scenario III, it was assumed that ASF spread nationwide and required 5 years to eradicate the disease. The export embargo was assumed to last for the full 5 years.

Economic impacts for Scenarios I and II were estimated as if the disease first occurred both in 1978 and in 1980. The purpose was to test the sensitivity of the impacts from the export embargo given that Canada's net trade balance in pork with the rest of the world increased significantly over this 2 year period. The impacts for Scenario III were estimated as if the disease first occurred in 1978 only. In addition, the impacts for Scenarios II and III were derived under the assumptions of a relatively low and a relatively high incidence of herd depopulation. The following table summarizes the economic impacts with the data representing present values in the initial year of outbreak.

Potential Impacts of ASF in Canada

Scenario/Initial Year of Outbreak		Low Depopulation Incidence	High Depopulation Incidence
		Million Canadian	dollars
1	- 1978	9.5	--
	- 1980	29.5	--
II	- 1978	169.1	344.0
	- 1980	239.7	496.5
III	- 1978	289.9	556.3

Two conclusions are obvious from the study. First, the estimated costs increase rapidly as both the incidence of herd depopulation increases and as the time required to eradicate the disease lengthens. Confining an ASF outbreak to a Scenario I situation would thus prevent significant economic losses. For example, the additional costs that would have been imposed had an outbreak spread from a Scenario I to a Scenario III case would have been between $280 and $545 million Canadian dollars in 1978 present value terms, depending on the incidence of herd depopulation.

Second, the economic losses from Scenarios I and II are much greater if the initial outbreak year is 1980 rather than 1978. This reflects the much greater potential for loss in periods when there is a healthy trade balance in pork because an export embargo would result in larger amounts of pork being diverted onto the domestic market that would otherwise have been exported. This would drive down retail and producers prices, resulting in a significant decline in producer incomes relative to the gains reaped by consumers. (B. Kirk, Food Markets Analysis Division, Marketing and Economic Branch, Agriculture Canada, 613 995-5880)

Focus on... Rinderpest

Rinderpest (RP) is an acute or subacute contagious viral disease of cattle, buffalo, and Asiatic swine. Less acute forms of rinderpest may occur in calves and resistant cattle.

History

The great epizootic of this disease, 376-386 A.D., was believed to have spread westward from the Caspian Basin along the Danube Valley to Europe. The disease was introduced to numerous RP-free countries in various parts of the world due to commercial movement of livestock. Isolated outbreaks have been confirmed in Belgium (1920), Italy (1921), and Brazil (1921), due to the importation of infected animals from enzootic areas. Europe, Australia, and the Western Hemisphere remain free from RP.

Africa and the Middle East

An international plan to control RP by mass vaccination, known as Joint Project (JP) 15, began during 1952 in the countries of central Africa, resulting in a significant reduction in the incidence of outbreaks. However, a decrease or cessation of RP vaccination in the past 10 years has permitted the disease to rapidly spread, beginning in 1979 in western Africa, to the east, south, and north. In 1982-83, it was reported in Chad,

Rinderpest World Distribution 1983

Niger, Nigeria, Sudan, Ethiopia, Egypt, and Somaliland. More than 162,393 Nigerian cattle died of RP in this period. The disease also spread to Saudi Arabia, with cattle imported from Somaliland, and to Lebanon.

Vaccination to control RP was recently completed in 4 million cattle in Sudan and 2-1/2 million in Niger, representing 15% and up to 78% of the cattle in the respective country. The Government of Israel began during 1982 to vaccinate a total of 305,153 cattle there and in areas that it occupies on the West Bank of the Jordan River. Two isolated outbreaks of RP were reported in the occupied areas in 1983.

Susceptible Species

Cattle and buffalo are highly susceptible to RP. The susceptibility of sheep and goats varies. Severe outbreaks occasionally may occur in these species; for example, 1,924 animals died in an infected herd of 6,726 sheep and 2,412 goats in India. Camels rarely contract the disease naturally. Natural outbreaks of RP occur in Asiatic pigs in India, Indochina, Indonesia, China, and the Philippines.

Other hoofed species (Artiodactyla) are susceptible to RP. These include free-living hippopotamus, wart hog, giraffe, eland, African buffalo, and impala. Some susceptible hoofed stock living in captivity are the wild pig, bushbuck,

setatunga, oribi, and black buck. Bush pig, Japanese deer, white-tailed deer, white-collared peccary, oryx, dik dik, and wildebeeste have been experimentally infected. Also, RP has been adapted to rabbits and chicken embryos in the laboratory. There is no evidence that RP virus causes human infection.

RP Virus

Most RP virus particles are spherical or ovoid, and 120-300 nm in diameter. The virus contains single-stranded RNA, and is classified in the Paramyxoviridae family, in the genus Morbillivirus, with the viruses of measles, canine distemper, and peste des petits ruminants (PPR).

Exposure to sunlight for 2 hours inactivates RP virus. It is also inactivated in 10 minutes at pH 2.0 and 12.0, and by ether, chloroform, and 0.1% betapropiolactone. The optimum pH range for survival is 7.2-8.6. Glycerol is detrimental to the virus and should not be used as a preservative.

Putrifaction and lactic acid fermentation in meat readily destroy RP virus, and it is inactivated in dead animals within 24 hours. It will remain viable in frozen tissues or tissue suspensions for at least a year.

Transmission

One to two days before fever, RP virus is excreted in the nasal secretion and declines to a low concentration by the 9th day after fever. The virus is highly disseminated by fecal excretions.

The disease is spread by direct and indirect means, and mainly by movement of infected animals. Close contact between infected and noninfected animals is usually necessary for spread to occur. The primary site of entry is through the nasopharyngeal mucosa. Inhalation has been suggested as the principal route of infection. Ingestion of contaminated feed may also be an important route. Many insects have been shown to contain the virus but have not been proven to be vectors.

Pathogenesis

Although all strains of RP virus are of one immunologic type, they may vary in virulence. Low virulent strains of RP virus occur naturally. They have been isolated on numerous occasions from wildlife in western and eastern Africa. These seemingly hypovirulent strains can regain their virulence when they are passaged in cattle.

The incubation period in susceptible cattle is 3 days following inoculation, and the disease course is 7-10 days. Under natural conditions, the incubation period is longer. Major clinical signs are high fever (105-107°F; 40.5-41.7°C) and lacrimation followed by mouth erosions; temperature decrease; diarrhea; dehydration; soiled, rough coat; loss of weight; and death within 2 weeks.

A high incidence of frank clinical cases is common when outbreaks occur in previously unaffected geographical areas. Some cattle have a high innate resistance to RP, and their infection results in a mild or subclinical illness.

Lesions

Lesions include punched-out-like erosions on the mucosa of the lower lip, gums, ventral surface of the tongue, and soft and hard palates. Lymph nodes are edematous. The abomasal mucosa is congested and hemorrhagic. Peyer's patches are hemorrhagic, necrotic, and eroded. Hemorrhage, edema, and erosions are found in the mucosa of the cecum and cecocolic junctions. "Zebra stripe" congestion is often seen in the mucosal surface of the terminal portion of the large intestine and rectum.

Diagnosis

RP is diagnosed by identification of the virus from affected animals. Acute signs of RP and high mortality rate may justify a presumptive diagnosis. Proper sampling and optimal time of collection are essential. The virus can be demonstrated in most, if not all, bodily secretions, during the febrile stage of the disease. In the blood, it is intimately associated with the leukocytes and can seldom be recovered from plasma or serum. Viral titers are also high in lymph nodes and spleen. Peak concentrations are reached at about the height of the temperature reaction and gradually subside, disappearing about a week after the temperature returns to normal in animals that recover.

In a country where the disease has never existed, the diagnosis of RP should fulfill Koch's postulates. These are:

1. Isolation and identification of the virus.

2. Reproduction of the disease in normal animals with the virus isolated from the field specimen.

3. Resistance of rinderpest-immunized animals to infection with the field isolate.

4. Demonstration of rinderpest antibodies in sera from field cases.

(Editor's note: Regulatory actions to stop an outbreak may be necessary before all of the postulates are fufilled.)

RP virus can be detected by several serologic tests, such as complement fixation (CF), agar gel diffusion precipitin (AGDP), fluorescent antibody (FA), and virus neutralization.

Detection of RP viral antigens by CF, AGDP, and FA test is quicker than virus isolation. Under optimal conditions, complement fixation tests for viral antigens may be completed in 6 hours. Antigen detection coincides with the rise in body temperature; therefore, for diagnostic purposes, lymph nodes for this test should be collected from animals slaughtered while febrile. Precipitin tests, using lymph nodes and rabbit hyperimmune serum, require up to 24-48 hours. Precipitin antigen in the prescapular lymph nodes of cattle infected with virulent RP virus may be obtained by biopsy from the prescapular lymph nodes of living animals. The antigen is detected in the samples on the 1st to 8th day after the onset of fever. The fluorescent antibody test requires 4-48 hours. A minimum of 5 days is necessary to complete the RP virus neutralization test.

RP antibodies may be detected by an AGDP test in 5 days and by virus neutralization in 4-7 days. Complement-fixing antibodies appear in serum of cattle between the 7th and 18th day and remain demonstrable for 6 months. Their short-lived appearance makes them unreliable for epizootiological surveillance. RP antibodies cannot be demonstrated in convalescent cattle serum in AGDP tests.

Successful enzyme-linked immunosorbent assay (ELISA) and immunoosmoelectrophoresis (IEOP) tests for RP antibodies have been reported, but additional work is needed for their use in RP surveillance.

Differential Diagnosis

Diseases that have clinical features common with rinderpest are bovine viral diarrhea, infectious bovine rhinotracheitis, acute gastroenteric conditions such as arsenic poisoning, and acute coccidiosis. The clinical and postmortem findings are not pathognomonic and may be similar to those seen in a number of other diseases such as jembrana disease, mucosal disease, bovine malignant catarrhal fever, and conditions associated with infection that produce erosions in the oral cavity and severe mortality.

Laboratory Specimens

Blood in heparin or EDTA (ethylenediaminetetraethylamine), mesenteric lymph nodes, and spleen should be collected in the early stages of the disease. Specimens should be collected only from a recently dead or sacrificed animal. The optimal time for collection is the 3rd to 6th day of fever. Spleen and mesenteric lymph nodes should be frozen. However, blood should not be frozen.

Serums should be collected from animals that live or recover, as well as from contact sheep, goats, and wild animals.

Specimens of tonsils, liver, spleen, kidney, intestines, lymph nodes, lung, and brain should be collected and placed in at least 10 volumes of neutral formalin.

Control and Eradication

Early diagnosis is essential for the control of RP outbreaks. Strict quarantine and control of cattle movements is highly effective in stopping the spread of this disease. Once the presence of the disease has been established, it should be quickly eradicated by destroying and safely disposing of all sick and exposed animals. Introduction of RP into the highly susceptible domestic and game animal populations of the United States would cause heavy losses.

Although tissue culture attenuated rinderpest vaccine is relatively inexpensive, the vaccine virus is not spread by contact, and one dose confers long-lasting immunity, it does have the potential to mask infections and complicate eradication efforts. Therefore, the use of rinderpest vaccine in the United States would not be justified except by the very unlikely possibility of extensive spread.

Needed Research

There is a need for more research to upgrade diagnostic methodology, discern fully the efficacy of rinderpest tissue culture-adapted vaccine for small ruminants, elucidate pathways of disease replication and transmission, and define virus types in relation to virulence. (Dr. A. H. Dardiri, Plum Island Animal Disease Center, 516 323-2500)